

Abstract:

An automation system that can detect and read digital watermarks in order to facilitate control of automation equipment such as pick and place machines or material handling robots. An image containing a digital watermark is printed on (or otherwise attached to) an item. The item can be a part such as an electronic component or it may be some other type of object. The image containing the digital watermark is printed or attached to the item at a particular location on the item and with a pre-determined orientation relative to the item. A machine vision system (i.e. a camera) is used to acquire a digital image of the item including an electronic version of the printed image that is attached to the item. The digital watermark can include an orientation or grid signal and a data payload signal. The grid signal can be used to determine the orientation and location of the image, and hence, the orientation and location of the item. The data payload can be used to carry any desired digital data. The ability to detect and read digital watermarks gives an automation system advantages over prior automation systems.